

**REMARKS**

Claims 1 and 3-18 are pending in this application. Claims 12-15, 17 and 18 are presently withdrawn from consideration. In view of the following remarks, reconsideration and allowance of claims 1 and 3-18 are respectfully requested.

**Interview**

Applicants appreciate the courtesies shown to Applicants' representative by Examiner Tentoni in the January 7, 2010 interview. Applicants' separate record of the substance of the interview is incorporated into the following remarks.

**35 U.S.C. §103(a) Rejections**

**Shimuzu, Schafer And Hutter**

Claims 1, 4-11 and 16 were rejected under 35 U.S.C. §103(a) as allegedly having been obvious over Shimuzu (JP 05-195309) in view of Schafer (U.S. Patent No. 6,103,158) and further in view of Hutter (U.S. Patent No. 6,551,545). Applicants respectfully traverse this rejection.

Claim 1 requires, among other features: (1) a first step of the cooling to be conducted in a first cooling zone and a second step of the cooling to be conducted in a second cooling zone that is beneath the first cooling zone, (2) wherein in the first cooling zone, the gaseous cooling medium is blown from a blowing device and a gaseous cooling medium flow is directed in such a way that it flows through the filament bundle transversely by sucking the gaseous cooling medium with a suction device after the gaseous cooling medium flows through the filament bundle, (3) at least a portion of the filament bundle in the first cooling zone being disposed between the blowing device and the sucking device, (4) wherein the gaseous cooling medium blown from the blowing device leaves the filament bundle substantially completely on a side opposite an inflow side, and (5) wherein in the second

cooling zone, the filament bundle is cooled further through self-suction of a gaseous cooling medium surrounding the filament bundle.

The above features of claim 1 provide effective cooling of extruded filaments, thereby producing filaments with improved homogeneity of physical properties over the cross section of the individual filaments. In this regard, a high degree of cooling is achieved as soon as possible after extrusion of the filaments in order to achieve rapid crystallization, thus obtaining filaments with little to no difference in crystallization behavior between the filament skin and the filament core. See, for example, paragraph [0008] of the specification.

The combination of Shimuzu, Schafer and Hutter would not have rendered obvious the above features (2)-(5) of claim 1, or the benefits associated therewith.

First, Shimuzu does not describe that at least a portion of the filament bundle in the first cooling zone is disposed between the blowing device and the sucking device, as required by above feature (3) of claim 1. Shimuzu describes a first cooling section having a blow-off section 14 that blows a cooling wind in a longitudinal direction. See paragraph [0014] of Shimuzu. Shimuzu describes a second cooling section having a blow-off section 15 located beneath the first cooling section. See paragraph [0016] and Fig. 1 of Shimuzu. Shimuzu describes that an exhaust air suction section 16 is formed between blow-off section 14 and blow-off section 15. See paragraph [0016] of Shimuzu. In other words, Shimuzu describes that the air suction section is located between the first cooling section and the second cooling section. The yarn (y) of Shimuzu does not pass between the air suction section 16 and a blow-off section, and thus the yarn (y) of Shimuzu is not located between a blowing device and air suction section 16. Thus, Shimuzu does not describe that at least a portion of the filament bundle in the first cooling zone is disposed between the blowing device and the sucking device, as required by claim 1.

Further, Shimuzu does not describe that in the first cooling zone, the gaseous cooling medium is blown from a blowing device and a gaseous cooling medium flow is directed in such a way that it flows through the filament bundle transversely by sucking the gaseous cooling medium with a suction device after the gaseous cooling medium flows through the filament bundle and the gaseous cooling medium blown from the blowing device leaves the filament bundle substantially completely on a side opposite an inflow side, as required by above features (2) and (4) of claim 1. As discussed above, Shimuzu describes a blow-off section 14 that is located above the air suction section 16. Thus, although the air blown from the blow-off section 14 of the first cooling zone is blown in a longitudinal direction when leaving the blow-off section 15, the air must travel in a downward direction to be sucked by the air suction device 16 (which is located below blow-off section 14). In other words, although some of the air blown by the blow-off section 14 may leave on a side opposite the blow-off section 14, the majority of the air is sucked downward (not transversely) by the air suction section 16. Thus, Shimuzu does not describe, and is not capable of, having the gaseous cooling medium blown from the blow-off section leave the filament bundle substantially completely on a side opposite an inflow side, as required by claim 1.

As a result of the deficiencies of Shimuzu, the yarn is not sufficiently cooled in the first cooling zone, resulting in an unwanted increase in inhomogeneity as compared to the method of claim 1. Thus, Shimuzu describes the second cooling zone having the blow-off section 15 which blows additional cooling medium. See the Abstract of Shimuzu. Thus, Shimuzu also does not describe the filament bundle is cooled further through self-suction of a gaseous cooling medium surrounding the filament bundle, as required by above feature (5) of claim 1.

In addition to the above, the Patent Office also admits that Shimuzu does not describe winding the filaments as thread after solidifying, as required by claim 1. See page 4, lines 2-4 of the Office Action.

Schafer and Hutter do not remedy the above deficiencies of Shimuzu with regard to claim 1.

Schafer describes that a filament bundle 4 advances through a upper cooling shaft 6, which is formed by a tube 9, downstream of a spinneret 3. See col. 4, lines 24-27 of Schafer. Schafer describes that a blower 12 is arranged in the tube 9. Schafer describes that downstream of upper cooling shaft 6, a tube 13 forms a lower cooling shaft 7. Schafer describes that between the tube 9 and the tube 13, a suction device 8 is arranged. See col. 4, lines 30-39 and Fig. 1 of Schafer. Schafer describes that the filaments 4 are cooled, after emerging from the spinneret 3, by an air stream that is directed radially over the circumference of the filament bundle 4 by the blowing device 10. See col. 5, lines 19-23. Schafer describes that the air stream is substantially entrained by the advancing filaments and removed by suction device 8, downstream of cooling shaft 6. In other words, the cooling air stream blown from the blowing device 10 travels downward with the filament bundle 4, and exits below the blowing device 10 via the suction device 8. Further, Figs. 1-3 of Schafer each show that the cooling air (indicated by arrows) does not travel transversely through the filament bundle 4. Thus, Schafer also does not describe, or provide any reason or rationale for one of ordinary skill in the art to have come to, above features (2) and (4) of claim 1.

Further, due to the inadequate cooling in the upper cooling shaft 6 of Schafer, Schafer describes that a cooling stream is generated in lower cooling shaft 7 by suction device 8, and not by self-suction. See col. 5, lines 27-33 of Schafer. This cooling stream in the lower cooling shaft 7 runs in a direction opposite the direction of the advancing yarn. See col. 5, lines 27-30 of Schafer. In other words, the direction of the cooling stream in the lower

section of Schafer is opposite to a flow direction that would be created by self suction. Thus, Schafer also does not describe, or provide any reason or rationale for one of ordinary skill in the art to have come to, above feature (5) of claim 1.

Hutter also does not remedy the above deficiencies Shimuzu and Schafer regarding features (2)-(5) of claim 1. Specifically, the Patent Office relies upon Hutter as allegedly describing above feature (5) of claim 1. However, Hutter does not describe, or provide any reason or rationale for one of ordinary skill in the art to have come to, above feature (5) of claim 1.

Hutter describes that the coolant stream in the tension zone (allegedly equivalent to the second cooling zone of claim 1) may be generated from the coolant leaving the cooling zone and from a coolant supplied in the inlet area downstream of the cooling zone. See col. 3, lines 11-21. Hutter describes that the coolant stream is accelerated to at least a flow velocity that equals the speed of the advancing filaments so that the filaments are not decelerated in their advancing movement. See col. 3, lines 4-10 of Hutter. Hutter describes that due to a vacuum and self-suction, an airstream is sucked from the outside through the air intake 33 into the cooling zone 4. Hutter describes that to generate a coolant stream, the coolant is blown into the cooling zone and then guided into the tension zone or coolant is blown directly into the tension zone. Hutter is thus clearly using a blowing device or vacuum in the tension zone to supply additional coolant. Hutter does not describe that in a second cooling zone, the filament bundle is cooled further through self-suction of a gaseous cooling medium surrounding the filament bundle, as required by above feature (5) of claim 1.

In addition, one of ordinary skill in the art would not have attempted to have combined Schafer and Hutter with any reasonable expectation of success. As discussed above, the direction of the cooling stream in the lower section of Schafer is opposite to a flow direction that would be created by self suction. Contrary to Schafer, Hutter requires that the

coolant stream be accelerated to at least a flow velocity that equals the speed of the advancing filaments so that the filaments are not decelerated in their advancing movement. See col. 3, lines 4-10 of Hutter. Thus, one would not have combined Schafer with Hutter because the cooling stream in the lower section of Schafer would decelerate the advancing movement of the filaments. This combination of Schafer and Hutter would change the operation of Hutter to an operation other than intended therein, and one of ordinary skill in the art thus could not have combined such references with any reasonable expectation of success.

Further, Hutter does not describe above features (2)-(4) of claim 1, and thus does not remedy the deficiencies of Shimuzu and Schafer in this regard. Thus, the combination of Shimuzu, Schafer and Hutter would not have rendered obvious claim 1.

Claims 4-11 and 16 depend from claim 1. For at least their respective dependency, and for the additional features recited, the combination of Shimuzu, Schafer and Hutter also would not have rendered obvious claims 4-11 and 16.

In view of the above, withdrawal of the rejection is respectfully requested.

Shimuzu, Schafer, Hutter And Gerking

Claim 3 was rejected under 35 U.S.C. §103(a) as allegedly having been obvious over Shimuzu in view of Schafer and Hutter and further in view of Gerking (U.S. Patent No. 4,202,855). Applicants respectfully traverse this rejection.

Gerking is merely cited as describing a flow speed of the gaseous cooling medium in the first cooling zone being between 0.1 and 1 m/s, as required by claim 3. Gerking describes a method for producing multifilament yarn, wherein before winding the yarn is subjected to forces produced by gas streams. See the Abstract of Gerking.

Gerking does not describe or provide any reason or rationale for one of ordinary skill in the art to have come to the above features (2)-(5) of claim 1. Thus, Gerking does not remedy the deficiencies of Shimuzu, Schafer and Hutter and the combination of Shimuzu,

Schafer, Hutter and Gerking would not have rendered obvious at least above features (2)-(5) of claim 1.

Claim 3 depends from claim 1. For at least its dependency, and for the additional features recited, the combination of Shimuzu, Schafer, Hutter and Gerking also would not have rendered obvious claim 3.

In view of the above, withdrawal of the rejection is respectfully requested.

**Rejoinder**

Applicants respectfully request rejoinder of claims 12-15 and 17-18, upon allowance of claims 1, 3-11 and 16.

**Concluding Remarks**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1 and 3-18 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



William P. Berridge  
Registration No. 30,024

Andrew B. Whitehead  
Registration No. 61,989

WPB:ABW/abw

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**OLIFF & BERRIDGE, PLC**  
**P.O. Box 320850**  
**Alexandria, Virginia 22320-4850**  
**Telephone: (703) 836-6400**

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